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Attend Southwestern Medical Conference in Albuquerque October 30th — November 1st

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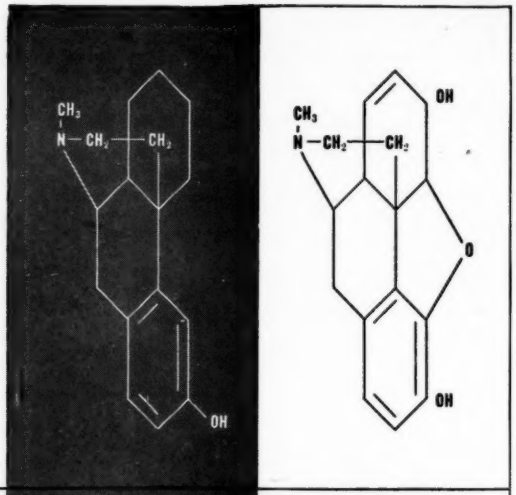

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De Rebus Medicis Et Politicis

BY ROBERT B. HOMAN, JR., M. D., EL PASO, TEXAS
MEMBER OF THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION

DON'T LET THEM TAKE WHAT AWAY?

At Chicago the dark horses were left at the post; the favorite sons were forgotten; the statesmen were ignored; and the politicians prevailed. The gents of both parties who wanted the job of president were pushed aside. Therefore, we have a choice in the forth-coming election between two gentlemen who, according to their statements, do not desire to be president of these United States of America. Both General Eisenhower and Governor Stevenson wish it to appear that they have been drafted to oppose each other in a race for the most important electoral office on the face of the earth. The sincerity of their positions in this matter might be criticized since they allowed certain known politicians to bring about their nominations in conventions which were quite obviously controlled.

The Republicans laid themselves open to criticism in several matters. In brief, they repudiated the party of Lincoln, they denied the only statesman in their fold, Mr. Taft, and they collectively moved much to the left of the traditional beliefs of the individual members of the real Republican Party. The left-wing element of the party was able to convince the convention that a shift to the left was necessary for victory. To a party out of control for twenty years, it seemed to be a case of "any port in a storm" — even the port of promising more for nothing than the present bureaucrats.

AVID HOPE

The avid hope of this convention was that the *name* of General Eisenhower will be sufficient to bring the party back into power. The good general has had vast experience in foreign affairs, but is little more than a novice in his understanding of the problems of the American citizen at home. The opposite can be said of Governor Stevenson.

The convention of the Democrats became an unholy alliance of several unholy alliances. Again the C. I. O. Political Action Committee selected the standard-bearer of the party after several snappy deals, and after breaking the hearts of a few aspirants for the office. When they pulled the rug from under Alben Barkley, they did it to a man who had been licking the boots of labor throughout his political life. Poor Alben must be wondering what one has to do to be president — for labor.

ADDED ATTRACTION

The socialist wing of the party — now known as the Americans for Democratic Action — nominated a millionaire "do-gooder," Mr. Harriman, and, as an added attraction, plunked in the name of our old friend Oscar Ewing, the taxpayer's philanthropist. The A. D. A. tried to insult states rights by attacking the South, and failed. But, having won their point, the Southern leaders are now trying to scramble back on the bandwagon so that they can "deliver" the "Solid South" back to the very people who are leading us to regimentation.

The Democrats adopted a campaign song which seems to express the attitude of a lot of Americans. It is entitled "Don't Let Them Take It Away." This song does not refer to the taxpayers — not the honest ones anyway! If Americans don't want their liberty taken away, they had better try to get a change by voting for Eisenhower. Everyone should know where the other gang wants to go after twenty years.

ANTIBIOTICS—ANTHRAX

Newer Antibiotics In The Treatment Of Anthrax

Gold, H. & Boger, W. P., New England J. M. 244:391, 1951

Aureomycin, Chloromycetin and terramycin were equally effective in controlling cutaneous anthrax. However, the authors state: "Ingestion of aureomycin was accompanied in some patients by intense nausea and vomiting, whereas neither Chloromycetin nor terramycin was associated with any un-toward reaction in this small group of patients."

[*Adequate control of anthrax is important since the bulk of carpet wool is imported from parts of the world where anthrax is especially infective. Wolff & Heimann, Am. J. Hyg. 53:80, 1951.*]

Clinical Clippings, May, 1951.

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APHORISMS TRUTHS AND CONCEPTS CONCERNING THE CARDIOVASCULAR SYSTEM

By Andrew M. Babey, M. D., F. A. C. P., Las Cruces, New Mexico

(1)

"Although finding a murmur does not mean subacute bacterial endocarditis, none whatsoever practically eliminates that diagnosis." — Samuel A. Levine, *Christian Memorial Papers*, Waverly Press, Baltimore, 1936, page 2.

(2)

"When these pulsations (abdominal aorta and femoral artery) are normal, coarctation of the aorta does not exist." — Samuel A. Levine, *loc. cit.*, page 2.

(3)

"Given a rapid heart with a rate of 160 to 190 if slight irregularities are heard even at rare intervals coming spontaneously or produced by deep breathing or pressure over the carotid sinus, one can be certain that the rapid rate is not due to paroxysmal auricular tachycardia." — Samuel A. Levine, *loc. cit.*, page 3.

(4)

"Coronary thrombosis in a patient with previous *persistent* auricular fibrillation is very rare." — Samuel A. Levine, *loc. cit.*

(5)

"Accentuation of the pulmonic second sound is a sign which I have found of little value in the diagnosis of mitral disease, as indeed of any other disease." — Richard Cabot, *Facts on the Heart*, W. B. Saunders Company, Philadelphia, 1926, page 59.

(6)

"Next to morphine, the most useful sedative for cardiac patients is chloral hydrate."— John Parkinson (Personal Communication).

(7)

Bad prognostic signs in heart disease are: paroxysmal nocturnal dyspnoea, bundle branch block, gallop rhythm, pulsus alternans, Cheyne-Stokes respiration, nephritis. — Samuel Levine, *Clinical Heart Disease*, W. B. Saunders Company, Philadelphia, 1936.

(8)

Mitral stenosis and failure with a regular rhythm carries a worse prognosis than mitral stenosis and failure with auricular fibrillation. — Samuel Levine, *Clinical Heart Disease*, W. B. Saunders Company, Philadelphia, 1936, page 278.

(9)

Mitral stenosis, auricular fibrillation, failure and a rate of 130 has a better prognosis than mitral stenosis, auricular fibrillation, failure and a rate of 80. — Samuel Levine, *loc. cit.*, page 278.

(10)

"Always question what a patient with Cheyne-Stokes respiration says. He is usually not himself." — John Parkinson (Personal Communication).

(11)

"You can expect to get poor results from digitalis with right heart failure." — John Parkinson (Personal Communication).

(12)

"So common is right-sided hydrothorax in cardiac failure that if it occurs on the left side only your diagnosis is to be questioned or you must seek for a cause of pleural adhesions in the right chest." — John Parkinson (Personal Communication).

(13)

"Aortic aneurysms do not all pulsate. The factors causing absence of pulsations are: 1) Absence of aortic incompetence. 2) Fixation by adhesions to surrounding bony structures. 3) A clot inside the aneurysm." — John Parkinson (Personal Communication).

(14)

"I have seen many patients die from too little digitalis, but almost never have I seen one die from too much digitalis." — Harlow Brooks (a statement made during Ward Rounds at Bellevue Hospital), 1934.

(15)

"When the choreatic movements are at all difficult to bring out, you can nearly always

succeed in eliciting them by asking the patient to hold his hand steadily above his head." — Lewellys Barker, *Clinical Medicine*, W. B. Saunders Company, Philadelphia, 1922, 1:45.

(16)

"Violent cough is often as bad as running upstairs as far as its effect on a weak heart is concerned."—Richard Cabot, *New England J. Med.*, 204:882, 1931.

(17)

"One may have quite a loud Austin-Flint murmur and the character and intensity will not differentiate it from a murmur due to real mitral stenosis. I do not recall at present any certain means of differentiation, or any case showing a thrill with an Austin-Flint murmur." — Paul White, *New England J. Med.*, 205:643, 1931.

(18)

(Arteriosclerotic heart disease) — "these patients are apt to get delirious easily with nothing to explain it—even at post mortem." — Richard Cabot, *New England J. Med.*, 201:489, 1929.

(19)

"Palpable thrill always means organic heart disease." — Richard Cabot, *New England J. Med.*, 201:489, 1929.

(20)

"Cardiac failure from emphysema alone is surprisingly rare, and when it occurs it is with normal rhythm and edema, and as a very late event that is almost invariably terminal. Recurrent bouts of failure are almost unknown. Examples of failure apparently due to emphysema are most often explained by associated cardiovascular disease, usually hypertension and in such, failure can be recurrent." — John Parkinson and Clifford Hoyle, *Quart. J. Med., New Series*, 6:83, 1937.

(21)

"You can go wrong on tracheal tug in two important ways. First, a pulsation that goes in and out, forwards and backwards. Put your finger under the cricoid and you feel that pulsation. That is nothing. Tracheal tug must be an up and down pulsation. The second source of error is a tracheal tug that comes during inspiration only. A good many patients without aneurysm have this." — Richard Cabot, *New England J. Med.*, 199: 947, 1928.

(22)

"Aneurysms rarely break externally. Often they break internally and most often into the pericardium." — Richard Cabot, *New England J. Med.*, 199:948, 1928.

(23)

(Speaking of a cardiac): "Loss of edema in one way or another, by tapping, by purgation, by diuretics is quite often followed by mental symptoms (irrationality, etc.). We do not know the reason. We conjecture that whatever toxic products were previously in the system become concentrated by the taking out of the edema which before that kept them diluted and so more or less harmless." — Richard Cabot, *New England J. Med.*, 199: 1219, 1928.

(24)

"Marked coarctation (of the aorta) is a very serious anomaly which usually kills in youth by one of four complications: heart failure, rupture of the aorta itself, apoplexy due to cerebral hemorrhage or thrombosis, and bacterial endocarditis invading the area of coarctation." — Paul White, *Heart Disease*, The Macmillan Company, New York, 1937, page 218.

(25)

"We must in most cases abandon the idea of cardiac death at the height of acute infectious diseases such as pneumonia, typhoid fever and septic fever — In place of heart failure we must write vasomotor failure." — Theodore Janeway, *N. Y. Med. J.*, 85:227, 1907.

(26)

"When congestive failure first appears in either aortic stenosis or aortic regurgitation, it is difficult to control, recurs quickly and indicates, usually, a short survival of a few months to a year or two." — Paul White, *Heart Disease*, The Macmillan Company, New York, 1937, page 451.

(27)

"A patient can scarcely be too old to have aortic dilatation or aortic incompetence due to syphilis." — John Parkinson, *Proc. Roy. Soc. Med.*, 23 (part 3):967, 1930.

(28)

". . . . in cases of recent coronary occlusion the occurrence of congestive heart failure should call for digitalis without undue hesitation. Scrupulous care, however, not to exceed the optimum dosage should be obliga-

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tory." — Drew Luten, *The Clinical Use of Digitalis,* Chas. Thomas, Baltimore, 1936, page 101.

(29)

"If a patient with continued pyrexia suddenly gets blood in the urine, a considerable quantity of albumin, and blood casts, this will strengthen the supposition that infectious endocarditis is the cause." — H. Cameron, *Guy's Hosp. Gaz.,* 34:173, 1920.

(30)

"There is, as you know, a form of pneumonia called "rheumatic pneumonia" which sometimes occurs with all the physical and rational signs of inflammatory pneumonia .... But that which gives this kind of pneumonia its distinctive character and makes it a species, is that all the symptoms of pneumonia may suddenly disappear without the gradual decrease observed in inflammatory pneumonia."— A Trousseau, *Clinical Medicine,* 2:663, 1882.

(31)

"I owe my reputation to the fact that I use digitalis in doses the text books say are dangerous and in cases that the text books say are unsuitable."—(Quoted from Wenckebach), *Lancet,* 2:633, 1937.

(32)

"A child with a very pronounced bruit of congenital heart disease may lose that bruit as it grows up." — Herbert French, *Clin. Jour.,* 47-48:149, 1918-19.

(33)

"Warming or heating a normal foot increases the circulation of it. When, however, the arteries of the foot are diseased, little or no increase of flow may be brought about, but it is quite certain that the warming or heating will increase the metabolism of the tissues and this increases the blood flow requirement. The circulation of the foot should be increased by warming the subjects trunk and thighs." — Sir Thomas Lewis, *Vascular Disorders of the Limbs,* H. Lewis & Company, London, 1936, page 49.

(34)

"There are no known substances that can be safely used to produce an adequate and sufficiently persistent dilatation (of these diseased peripheral vessels). There is no known remedy of this kind so persistently potent as warming of the body, and this is simple, economical and safe." — Sir Thomas Lewis, *Vascular Disorders of the Limbs, loc. cit.,* page 49.

The President's Column

By Dr. James S. Walsh, Douglas, Arizona
President, Southwestern Medical Association

In addition to publishing SOUTHWESTERN MEDICINE, the Southwestern Medical Association presents each year, an outstanding medical meeting for the doctors in these southwestern states and northern Mexico. The annual meeting is of the post-graduate type, all lectures are given by guest speakers who are selected from our leading medical centers, all are exceptional teachers and lecturers. Those of you who have attended previous meetings well know their fine quality, but to the many of you who have never attended, I would like to make a special appeal.

This year's meeting will be held in Albuquerque, Oct. 30 through Nov. 1. Dr. Wesley O. Connor, Jr., general chairman, of the meeting and the doctors of Albuquerque will welcome you to three days of top flight medical lectures and three evenings of unsurpassed entertainment including a "name band" dinner dance, and a football game between the University of New Mexico and the University of Arizona.

SPANISH CHARM

Albuquerque, a city of old Spanish charm and new industrial growth, located in north-central New Mexico at an elevation of 5,000 feet, with a metropolitan population of 150,000, provides an ideal convention city. It is readily accessible by rail, air, bus, and highway from all sections of the southwest. The city offers four first class hotels that contain 1200 rooms and 119 motels with over 2000 units, ample accommodations for all who wish to attend. Now is the time to plan on being in Albuquerque on Oct. 30 for the 1952 meeting of the Southwestern Medical Association.

The professional program this year promises to be one of the best. Five outstanding guest speakers will bring the newest developments in medical science to your very doorstep. Among the speakers on this years program will be nationally prominent authorities in the fields of cardiology, cancer, urology, ophthalomology, and pathology, whose lectures will be directed primarily to the benefit of those in general practice. There will be material presented of interest and profit to every doctor in the Southwest.

GENERAL PRINCIPLES OF DERMATOLOGICAL THERAPY*

By George K. Rogers, M. D., Phoenix

There is no specialty in the field of medicine that has a greater range of possible remedies than the specialty of dermatology. Therapy in dermatology can roughly be divided into three main headings.

One: Internal
Two: External
Three: Environmental

In this paper only external and environmental therapy will be discussed. Of the three, local treatment still constitutes the most important weapon and upon the proper selection and application of external remedies depends the success or failure of many skin diseases. In many cases one must treat the condition of the skin rather than the specific disease itself. For practical purposes, therefore, the external treatment of the skin can roughly be divided into three classes: acute, subacute and chronic.

A. Acute skin conditions. That is where the skin is angry, swollen, with vesiculation and weeping. When the dermatitis is localized, the best forms of therapy in order of their preference are:

1. Wet compresses
2. Pastes
3. Emulsions

Where the dermatitis is more or less generalized the applications of preference are:

1. Baths and wet compresses
2. Emulsions
3. Pastes

B. In sub-acute skin conditions both local and general the external remedies of preference are:

1. Lotions
2. Pastes
3. Salves

C. Chronic conditions where the skin is dry, thick, scaly and pruritic. The applications of choice in local conditions are:

1. Salves
2. Pastes
3. Emulsions

Where the eruption is general, the applications of preference are:

1. Salves
2. Emulsions
3. Pastes

*Read before the Yavapai Ariz. County Medical Society.

WET DRESSINGS

Wet dressings play a very important role in dermatological therapy, in that they are excellent measures for maintaining drainage of infected areas, preventing rapid changes of temperature and therefore act as excellent antipruritics and analgesics. Depending upon the agent used, they may act as soothing agents and can, therefore, be very effective in relieving superficial inflammations. The solutions of choice are:

1. Aluminum acetate (Burrow's solution); one to two per cent. Prescribe one to four teaspoons of the powder to one pint of water.

2. Boric acid solution: one to two per cent.

3. Magnesium sulfate: one-half to one tablespoon to one quart of water.

4. Fresh cow's milk: Valuable for treating dermatitis of the eyelids.

These dressings may be used hot, cold or room temperature, but in most cases room temperature is best. Whether you use an open dressing or a closed dressing (covered with cellophane or waxed paper rather than oiled silk or rubber), the dressing is to be kept damp and not permitted to become dry. The dressing may be rewet by pouring on more solution or by redipping in the solution. Do not wet dress more than one third of the body at any one time, and protect the patient from chilling. The best material to use is cotton sheeting (which is better than gauze which has a wide mesh) and should be of several thicknesses and kept clean. In most cases changing the dressing two or three times a day is sufficient.

BATHS

Baths are generally useful in place of wet dressings when the condition is general and achieve soothing antipruritic effects with added effects of active medicinal ingredients. Baths should be warm (95-100 degrees F) and the patient instructed to soak twenty to thirty minutes, again taking precautions against chilling.
Baths of value are:

1. Starch baths: Two cups of linit starch to a half tub of warm water. This is soothing and drying and, therefore, of value in acute inflammatory skin diseases where there is not much weeping.

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2. Oat meal baths: One or two cups of Aveeno to a half tub of water. This bath is soothing, less drying than starch and is useful when the skin begins to feel too dry.

3. Potassium permanganate: Thirty grains to the half tub of warm water. This is excellent where there is weeping, infection, blisters or large bullae.

PASTES

A paste is a semi-solid containing equal parts or more of a powder in a greasy base such as lanolin or petrolatum or in combination. A good example is Lassar's paste which consists of zinc oxide powder in equal parts of lanolin and petrolatum. Crude coal tar paste is made by adding tar to Lasar's paste.

Other ingredients such as sulfur, resorcin, etc., may be added. A paste is thicker, drier, and more solid than a salve (ointment). It absorbs secretion from the skin, thereby acting as a drain and also keeping the active medication in direct contact with the skin. Thus they are of value in treating eczema, whether acute or chronic. They are, however, less penetrating than salves. Pastes are generally applied thick, not rubbed in, and covered, changing the dressing once a day. It is advisable to tell the patient not to clean off the paste before each application, as this encourages the patient to further traumatize an already inflammed surface.

SALVES

A salve contains less than 50 per cent solid in a greasy base similar to that used in a paste and therefore will not absorb moisture from the skin surface. For this reason it is contraindicated on oozing surfaces. Exceptions are seen in superficial weeping infections such as impetigo or infectious eczematoid dermatitis where such new salves as Polysporin, Bacitracin or Neomycin are of value; or, in acute diseases where the skin has become dry, a bland salve such as boric acid is useful. A salve however, is more penetrating than a paste. Salves should be applied thin and generally rubbed in and may be covered or left uncovered. Adhesive tape should not be used in close proximity to the inflamed surface. If applied to hairy areas such as the axilla, they may produce a folliculitis. Salves, therefore, are useful in treating infected, subacute and chronic skin ailments. Anti-histamine salves such as Thephorin or Perazil ointments and the newer Eurax and Quotane ointments are useful adjuncts in the treatment of pruritic and/or allergic skin diseases.

LOTIONS

A lotion is a liquid watery mixture and contains ingredients in solution or suspension or both. A good example is calamine lotion, which fundamentally consists of zinc oxide powder suspended in rose water. It is a bland drying lotion to which many antipruritic substances such as menthol, phenol, or active medicaments such as sulfur, resorcin or tar may be added. It is best applied with the bare hands or a brush and should be applied frequently. The first coat should not be removed before applying a second. If the lotion becomes thick on the skin, sponges of boric acid solution may be used for removal. Lotions do not penetrate as well as ointments but their superficial actions are frequently advantageous.

EMULSIONS

An emulsion is an oily substance suspended in a liquid which is usually an aqueous solution. Thus to the calamine lotion, an ounce or two of olive oil added will make an emulsion. They are useful where one does not wish the drying effect of a lotion.

CLEANSING MEASURES

Cleansing measures are useful for removal of other medicines, crusts, dirt, etc.

1. Warm soap and water.
2. Boric acid solution as used for a wet dressing.
3. Olive oil or other vegetable oil rather than a mineral oil to which the patient is likely to become sensitized, and mineral oil also has a more drying effect on the skin than a vegetable oil.
4. Soap substitutes such as Lowila cake or Acidolate, Tersus or Phisoderm.

POWDERS

Powders are of value where the folds of the skin come together, such as the groin, under the breasts and between the toes. A mild useful powder is Parke-Davis Comfort powder or any zinc stearate powder.

TINCTURES

Tinctures consist of solutions of active ingredients in alcohol, such as Gentian violet, which in one or two per cent strength is useful in monilial (yeast) infections of the skin.

CHEMICALS APPLIED DIRECTLY

1. Trichlor or bichloracetic acid is useful in treatment of warts, keratoses or tattoo marks.

2. Resorcin in peeling pastes is useful for the removal of pigmentation and scars, especially those following acne.

PHYSICAL AGENTS

1. X-Ray and radium. In spite of inherent dangers, both X-ray and radium are extremely valuable agents in the treatment of skin disorders and should no more be frowned upon because of an accidental burn than should penicillin or other antibiotics because one occasionally gets an untoward reaction. In the hands of an experienced dermatologist, small superficial doses of X-ray, which produce stimulation and healing, will give rapid relief in many acute and chronic skin disorders. Used in heavier and more penetrating doses, advantage is taken of their inhibiting and destructive action in treating benign, (such as the common wart, keloid, etc.) and malignant tumors.

2. Ultra-violet light. Ultra-violet while contraindicated in certain skin diseases, such as lupus erythematosus and rosacea, is used with value in many others. Depending upon the source of light, distance, time and area treated it may be mildly stimulating or more destructive in its action. The destructive action is entirely superficial, is not permanent nor does it give later sequelae such as chronic radio-dermatitis. In sufficient doses it results in erythema with subsequent peeling of the skin and/or pigmentation. Pigmentation may be achieved without previous erythema by oiling the skin prior to exposure, the fats absorbing most of the erythema — producing rays. Ultra-violet light also has a general tonic effect and provides a source of Vitamin D. Advantage is frequently taken of the light-sensitizing effects of certain drugs, such as coal tar derivatives, in the treatment of certain skin diseases where one wishes to increase the effect of the ultra-violet radiation. This is utilized in treating psoriasis, the affected parts being rubbed with 5 per cent crude coal tar salve with subsequent exposure to ultra-violet light. The diagnostic value of ultra-violet rays is seen in the application of the "wood filter." This is used in a dark room where ultra-violet rays pass through nickel oxide glass producing the so-called "black light" and is used in diagnosing and treating fungus infection of the scalp.

3. Heat, such as coagulation and desiccation. Desiccation is more superficial than electro-coagulation and is, therefore, more useful in removing superficial skin lesions. The more destructive effect of coagulation is of value in treating epitheliomas. The endotherm knife is used for removal of a skin lesion without bleeding.

4. Electrolysis. This is accomplished by means of a weak galvanic current and a special fine needle which is used to permanently remove superfluous hair, destroying small blood vessels, warts, etc.

5. Cryotherapy. Solid carbon dioxide is valuable in treating birthmarks and superficial keratoses. The resultant scars if any, are excellent from a cosmetic standpoint. When it is mixed with acetone and sulfur the resulting "slush" is used as a peeling agent in treating post-acne scars and skin pigmentations such as chloasma and freckles.

ENVIRONMENT

Where other therapeutic measures fail, a change of environment frequently gives the desired beneficial results. This is especially true in dermatoses of allergic or contact origin and is one reason why one sees so many cases of atopic eczema or neuro-dermatitis in the Southwest, patients having been sent here from all over the United States after all therapeutic remedies at home had been exhausted. Environmental changes are probably based on changes in contact factors, as well as mental and emotional factors.

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Texas Physician is Rotary International District Governor

Howard Owen Smith, superintendent and chief surgeon of The Torbett Clinic and Hospital in Marlin, Tex., is a District Governor of Rotary International, world-wide service club organization, for the 1952-53 fiscal year. As Governor, he coordinates activities of the 26 Rotary Clubs in District 187, one of eight in Texas. During the year, he will visit each of the Clubs to offer advice and assistance in Rotary service work and club administration.

Dr. Smith received his M. D. degree from the Texas University Medical School in Galveston in 1922. He is a Past President of the Falls County Medical Society, the Texas Association of Obstetricians and Gynecologists and an Examiner in Surgery of the Texas State Board of Medical Examiners. A member of the Rotary Club of Marlin since 1932, he is a Past President of that Club.

2. Oat meal baths: One or two cups of Aveeno to a half tub of water. This bath is soothing, less drying than starch and is useful when the skin begins to feel too dry.

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A salve contains less than 50 per cent solid in a greasy base similar to that used in a paste and therefore will not absorb moisture from the skin surface. For this reason it is contraindicated on oozing surfaces. Exceptions are seen in superficial weeping infections such as impetigo or infectious eczematoid dermatitis where such new salves as Polysporin, Bacitracin or Neomycin are of value; or, in acute diseases where the skin has become dry, a bland salve such as boric acid is useful. A salve however, is more penetrating than a paste. Salves should be applied thin and generally rubbed in and may be covered or left uncovered. Adhesive tape should not be used in close proximity to the inflamed surface. If applied to hairy areas such as the axilla, they may produce a folliculitis. Salves, therefore, are useful in treating infected, subacute and chronic skin ailments. Anti-histamine salves such as Thephorin or Perazil ointments and the newer Eurax and Quotane ointments are useful adjuncts in the treatment of pruritic and/or allergic skin diseases.

LOTIONS

A lotion is a liquid watery mixture and contains ingredients in solution or suspension or both. A good example is calamine lotion, which fundamentally consists of zinc oxide powder suspended in rose water. It is a bland drying lotion to which many antipruritic substances such as menthol, phenol, or active medicaments such as sulfur, resorcin or tar may be added. It is best applied with the bare hands or a brush and should be applied frequently. The first coat should not be removed before applying a second. If the lotion becomes thick on the skin, sponges of boric acid solution may be used for removal. Lotions do not penetrate as well as ointments but their superficial actions are frequently advantageous.

EMULSIONS

An emulsion is an oily substance suspended in a liquid which is usually an aqueous solution. Thus to the calamine lotion, an ounce or two of olive oil added will make an emulsion. They are useful where one does not wish the drying effect of a lotion.

CLEANSING MEASURES

Cleansing measures are useful for removal of other medicines, crusts, dirt, etc.

1. Warm soap and water.
2. Boric acid solution as used for a wet dressing.
3. Olive oil or other vegetable oil rather than a mineral oil to which the patient is likely to become sensitized, and mineral oil also has a more drying effect on the skin than a vegetable oil.
4. Soap substitutes such as Lowila cake or Acidolate, Tersus or Phisoderm.

POWDERS

Powders are of value where the folds of the skin come together, such as the groin, under the breasts and between the toes. A mild useful powder is Parke-Davis Comfort powder or any zinc stearate powder.

TINCTURES

Tinctures consist of solutions of active ingredients in alcohol, such as Gentian violet, which in one or two per cent strength is useful in monilial (yeast) infections of the skin.

CHEMICALS APPLIED DIRECTLY

1. Trichlor or bichloracetic acid is useful in treatment of warts, keratoses or tattoo marks.

2. Resorcin in peeling pastes is useful for the removal of pigmentation and scars, especially those following acne.

PHYSICAL AGENTS

1. X-Ray and radium. In spite of inherent dangers, both X-ray and radium are extremely valuable agents in the treatment of skin disorders and should no more be frowned upon because of an accidental burn than should penicillin or other antibiotics because one occasionally gets an untoward reaction. In the hands of an experienced dermatologist, small superficial doses of X-ray, which produce stimulation and healing, will give rapid relief in many acute and chronic skin disorders. Used in heavier and more penetrating doses, advantage is taken of their inhibiting and destructive action in treating benign, (such as the common wart, keloid, etc.) and malignant tumors.

2. Ultra-violet light. Ultra-violet while contraindicated in certain skin diseases, such as lupus erythematosus and rosacea, is used with value in many others. Depending upon the source of light, distance, time and area treated it may be mildly stimulating or more destructive in its action. The destructive action is entirely superficial, is not permanent nor does it give later sequelae such as chronic radio-dermatitis. In sufficient doses it results in erythema with subsequent peeling of the skin and/or pigmentation. Pigmentation may be achieved without previous erythema by oiling the skin prior to exposure, the fats absorbing most of the erythema — producing rays. Ultra-violet light also has a general tonic effect and provides a source of Vitamin D. Advantage is frequently taken of the light-sensitizing effects of certain drugs, such as coal tar derivatives, in the treatment of certain skin diseases where one wishes to increase the effect of the ultra-violet radiation. This is utilized in treating psoriasis, the affected parts being rubbed with 5 per cent crude coal tar salve with subsequent exposure to ultra-violet light. The diagnostic value of ultra-violet rays is seen in the application of the "wood filter." This is used in a dark room where ultra-violet rays pass through nickel oxide glass producing the so-called "black light" and is used in diagnosing and treating fungus infection of the scalp.

3. Heat, such as coagulation and desiccation. Desiccation is more superficial than electro-coagulation and is, therefore, more useful in removing superficial skin lesions. The more destructive effect of coagulation is of value in treating epitheliomas. The endotherm knife is used for removal of a skin lesion without bleeding.

4. Electrolysis. This is accomplished by means of a weak galvanic current and a special fine needle which is used to permanently remove superfluous hair, destroying small blood vessels, warts, etc.

5. Cryotherapy. Solid carbon dioxide is valuable in treating birthmarks and superficial keratoses. The resultant scars if any, are excellent from a cosmetic standpoint. When it is mixed with acetone and sulfur the resulting "slush" is used as a peeling agent in treating post-acne scars and skin pigmentations such as chloasma and freckles.

ENVIRONMENT

Where other therapeutic measures fail, a change of environment frequently gives the desired beneficial results. This is especially true in dermatoses of allergic or contact origin and is one reason why one sees so many cases of atopic eczema or neuro-dermatitis in the Southwest, patients having been sent here from all over the United States after all therapeutic remedies at home had been exhausted. Environmental changes are probably based on changes in contact factors, as well as mental and emotional factors.

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Texas Physician is Rotary International District Governor

Howard Owen Smith, superintendent and chief surgeon of The Torbett Clinic and Hospital in Marlin, Tex., is a District Governor of Rotary International, world-wide service club organization, for the 1952-53 fiscal year. As Governor, he coordinates activities of the 26 Rotary Clubs in District 187, one of eight in Texas. During the year, he will visit each of the Clubs to offer advice and assistance in Rotary service work and club administration.

Dr. Smith received his M. D. degree from the Texas University Medical School in Galveston in 1922. He is a Past President of the Falls County Medical Society, the Texas Association of Obstetricians and Gynecologists and an Examiner in Surgery of the Texas State Board of Medical Examiners. A member of the Rotary Club of Marlin since 1932, he is a Past President of that Club.

THE CURRENT STATUS OF PLASMA VOLUME EXPANDERS*

By Jonathan E. Rhoads, M. D., University of Pennsylvania, Philadelphia

Interest in the plasma substitutes, as they were formerly called, reached a peak during World War I and again during World War II. Interest has been especially intensified since it became known that the Russians were producing atomic explosions.

In order to appreciate the need for a plasma volume expander, it is necessary to re-consider for a minute the potentialities of atomic warfare. It has been estimated that a single bomb, of the type dropped at Hiroshima, if released over the center of Philadelphia and detonated at an elevation of about 2,000 feet, would produce serious injuries for a radius of more than a mile and a half and that over 300,000 persons would be within the stricken area during rush hours. Of these 300,000 persons, it has been estimated that perhaps 75,000 would be killed or would die within the first 24 hours. This compares with an annual death rate in Philadelphia of approximately 25,000. It is further estimated that there might be 100,000 individuals with serious injuries composed of thermal burns, with or without associated mechanical injuries. An additional 25,000 would be likely to have serious mechanical injuries without thermal burns and 30,000 individuals would be likely to have serious radiation injury.

ROUGH GUESS

A very rough guess of the blood and plasma requirements for proper treatment of this number of casualties is shown in Table I.

TABLE I

PROBABLE PLASMA REQUIREMENTS
AFTER A SINGLE AIR BURST OVER A CITY
such as Philadelphia

		Blood or Plasma Required
Radius of Severe Injuries	3,000 yards	
Population in Affected Area	300,000 persons	
Total Injuries:		
Severe But Not Hopeless	200,000 persons	
Mechanical Injuries Only	25,000 persons	50,000 liters
Thermal Injuries — with or without mechanical injuries	100,000 persons	200,000 liters
Radiation Injuries	30,000 persons	50,000 liters
Total		300,000 liters

You will note that we come up with the figure of 300,000 liters. Possibly, the 50,000 liters reserved for radiation injuries would not be required during the first few days, but the other 250,000 liters would be needed mainly during the first 24 or 36 hours.

It has been estimated that all of the blood collected in this Country during World War II might be inadequate to provide for the atomic casualties of a single day. Since whole blood can only be stored for a few weeks by present methods, one would have to think in terms of plasma and a million donors would provide only about 250,000 liters of plasma.

It quickly becomes evident that potential supplies of blood and plasma cannot possibly be kept in readiness in the many target cities and that we must depend on a substitute if we are to be prepared to take care of the casualties of but a single effectively placed atomic bomb. If one contemplates successful attacks with multiple bombs on a number of American cities, the problem is vastly multiplied.

CRITERIA

In evaluating the various plasma expanders which become available, one needs to have a set of criteria on the basis of which they may be compared. First, one would insist that they not be antigenic, lest anaphylactic shock be superimposed on traumatic shock. Second, they must be free of pyrogens. Third, they must be non-toxic for the parenchymatous organs. Fourth, comes effectiveness in increasing plasma volume. Fifth, the substitute should remain in the circulation long enough so that the patient will not relapse into shock as a result of its excretion. Sixth, the material should not be stored in the body for long periods. Seventh, the material must be effective in raising the blood pressure promptly in shock due to decreased plasma volume. Some substances, otherwise suitable, occasionally have a depressing effect on blood pressure when they are first administered. Eight, the material should remain fluid and stable at a wide range of temperatures and for long periods of time. Ninth, the material should be plentiful and inexpensive. Tenth, it should be reproducible, preferably containing molecules whose size falls in a narrow range. These desired characteristics are summarized in Table II.

*This investigation was supported in part by the Medical Research and Development Board, Office of the Surgeon General, Department of the Army.

*From the Harrison Department of Surgical Research, Schools of Medicine, University of Pennsylvania, and the Surgical Clinic of the Hospital of the University of Pennsylvania, Philadelphia.

TABLE II

CHARACTERISTICS OF AN IDEAL PLASMA VOLUME EXPANDER

1. Non-Antigenic
2. Non-Pyrogenic
3. Non-Toxic for the Parenchymatous Organs
4. Effective in Increasing Plasma Volume
5. Should Remain in the Circulation Long Enough
6. Should Not be Stored in the Body for Long Periods
7. Effective in Promptly Raising Blood Pressure in Traumatic Shock
8. Fluid and Stable at a Wide Range of Temperature
9. Plentiful and Inexpensive
10. Reproducible with Narrow Range of Molecular Weight

FIVE CATEGORIES

A considerable group of materials has already been evaluated or is in the process of being evaluated as plasma volume expanders. These materials fall into five general categories. The first, the polymerized carbohydrates — including acacia, which was developed and, to some extent employed during the first World War; pectin, dextran, and polyglucose. The second are the proteins — gelatin, oxypolygelatin, and modified gelatin. The third are the plastics — methylcellulose, and polyvinylpyrrolidone, otherwise known as P.V.P. or, in the German literature, as periston. The fourth are the blood derivatives — including albumin, hemoglobin, and modified globin, and certain other plasma protein fractions developed by Cohn. The fifth, saline and certain mixtures of sodium salts. See Table III.

TABLE III

AVAILABLE PLASMA VOLUME EXPANDERS

Polymerized Carbohydrates	Proteins	Plastics
ACACIA	GELATIN	METHYL CELLULOSE
PECTIN	OXYPOLYGELATIN	POLYVINYLPYRROLIDONE
DEXTRAN	MODIFIED GELATIN	
POLYGLUCOSE		

Blood Derivatives	Saline
ALBUMIN	P.S.S.
MODIFIED GLOBIN	SODIUM LACTATE
HEMOGLOBIN	OTHER

Of these various materials, we may perhaps dismiss, with brief consideration, those which have already been discarded on one basis or another, as shown in Table IV. Acacia is retained to a great extent in the body and is also known to be antigenic. Certain candy workers and others sensitized to it have had fatal anaphylactic shock following its administration. Pectin has been criticized on the basis of retention, as has methylcellulose. All of the blood derivatives may be criticized because of the short supplies, if they are derived from human blood, or because of antigenicity if they are derived from animal blood. A special case has been built up for the derivatives of red cells since large numbers of these are discarded anyhow in the course of a large scale plasma program. While hemoglobin may be fairly well tolerated by the normal kidney, it is not well tolerated by the ischemic kidney such as is commonly encountered in shock. It is in this situation where it may cause oliguria or anuria. The hemoglobin molecule was, therefore, broken down to globin and this was somewhat modified by Strumia and his associates.[1] The resulting material has been given a considerable clinical trial at the Bryn Mawr Hospital. Our own experience with it has been unsatisfactory in that it occasionally produces a depression of blood pressure when rapid infusions are started. Thus, in just those situations in which a plasma expander might be needed most acutely, it cannot be depended upon to give uniformly good results.

TABLE IV

PLASMA VOLUME EXPANDERS NOW LARGELY DISCARDED
November 1951

Substance	Objection
ACACIA	Antigenic — Stored in Liver
PECTIN	Excessive Storage
METHYL CELLULOSE	Excessive Storage
ALBUMIN	Cost — Short Supply
GLOBIN	Uncertain Blood Pressure Response
HEMOGLOBIN	Kidney Damage

OTHER MATERIALS

The materials remaining for consideration are gelatin and its derivatives, dextran, polyglucose, and polyvinylpyrrolidone.

A systematic study of any plasma volume expander may properly include the items shown in Tables V and VI. In Table V are

TABLE V

PLASMA VOLUME EXPANDERS
SYSTEM OF STUDY FOR POSSIBLE TOXIC EFFECTS

LIVER FUNCTION		RENAL FUNCTION
Bromsulfalein Retention		Routine Urinalysis
Gamma Globulin		Addis Counts
Cephalin Cholesterol Flocculation		T_mPAH (max. tubular excretion of para-amino hippuric acid)
Thymol Turbidity		ERPF (effective renal plasma flow)
Thymol Flocculation		GFR (glomerular filtration rate)
Serum Lipid		
PYROGENICITY	Experimental Animals	EFFECT ON COAGULATION
ANTIGENICITY		EFFECT ON SEDIMENTATION
BLOOD PICTURE		EFFECT ON CROSS-MATCHING

listed studies for possible toxic effects. Under liver function, Dr. John Reinhold and Miss von Freijtag Drabbe[2] have been studying serum bilirubin concentration, bromsulfalein retention, urine urobilinogen, gamma globulin, cephalin cholesterol flocculation, thymol turbidity, and serum lipid concentration. Under renal function, Dr. Alexander Michie[3] and Dr. Harold Barker have been studying routine urinalysis, Addis counts, maximum tubular excretion of para-amino hippuric acid, effective renal plasma flow, and glomerular filtration rate. Studies of pyrogenicity and antigenicity have, for the most part, been done in experimental animals, and Dr. Parkins[4] has done some of the pyrogen studies in our laboratory. Studies on the blood picture, on blood coagulation, on erythrocyte sedimentation, and on cross-matching are also important.

Table VI lists studies concerned with demonstrating the effectiveness of plasma volume expanders. A series of animal tests have been very helpful in making accurate comparisons. The dog has been used for the hemorrhage experiments and the rat for the burn experiments. It is unfortunate that the dog appears to be an unsuitable animal for the study of polyvinylpyrrolidone, sometimes showing wheals and other manifestations of abnormal capillary permeability when it is first given. Likewise, the rat seems to have an idiosyncrasy for dextran and is probably an unsuitable test animal for that material. Some use has been made of rabbits but no large body of data has been developed in this animal as yet.

TABLE VI

PLASMA VOLUME EXPANDERS
SYSTEM OF STUDY FOR EFFECTIVENESS

I. ANIMALS
- A. Mild Hemorrhagic Shock
- B. Severe Hemorrhagic Shock
- C. Burns

II. PATIENTS
- A. Replacement of Hemorrhage
  1. Plasma Volume Measurements
  2. Plasma Concentration Measurements
- B. Response During Operative Hypotension
  1. Direct Arterial Blood Pressure Tracings
  2. Ballistocardiographic Index

STUDIES LIMITED

Studies in patients or in human volunteers are necessarily a good deal more limited in scope than those carried out in animals. It is difficult to test a plasma volume expander fairly by simply giving the material to a normal human being, because it has been shown that, if plasma is used in this way, most of it will have disappeared from the circulation in from 12 to 24 hours. It seemed better, therefore, in studying retention of material first to bleed a volunteer and then immediately to replace the blood which was withdrawn with a plasma substitute. The amount of blood withdrawn has usually been 1000 cc. We do not have as extensive studies of this nature as we would like because of a somewhat limited supply of suitable volunteers. In a few experiments which have been done by Dr. John Elder, Dr. Harold Barker, and Dr. James Walker[5] with oxypolygelatin, however, rather satisfactory results have been obtained, so far as plasma volume is concerned. Measurements at six and at 12 hours following infusion indicated that the material remained in the circulation until it was gradually replaced with native serum protein, so that the blood volume was, at all times, about equal to the individuals initial volume before the hemorrhage.

When the concentration of infused material is analyzed chemically and the total grams of material remaining in the circulation calculated from this figure and the figure for plasma volume, one finds that somewhat less than 50 per cent of the material remained in the circulation at 12 hours. However, as long as it remains for a sufficient period for the body to mobilize native serum protein, it should prove quite satisfactory. It is still somewhat uncertain what would happen if the material was given to a debilitated individual who, for nutritional reasons, was slow in mobilizing native protein.

ANOTHER APPROACH

Another approach to the study of the effectiveness of plasma volume expanders in man has been the use of such expanders in individuals who are in shock or who develop hypotension on the operating table. Figure 1 shows the very satisfactory response obtained with ossein gelatin in a patient who had a severe hemorrhage following high ligation of the saphenous vein. More recently, Dr. John Elder and Dr. Robert Dripps [6] have studied a series of patients in the operating room with various plasma volume expanders. With the exception of globin, good results were obtained with each of the materials tried, namely polyvinylpyrrolidone, gelatin, and dextran. The response was measured by intra-arterial blood pressure, utilizing an apparatus developed by Dr. John Lilly and Dr. Lysle Peterson[7]. It is useful for a number of purposes and requires such a fine can-

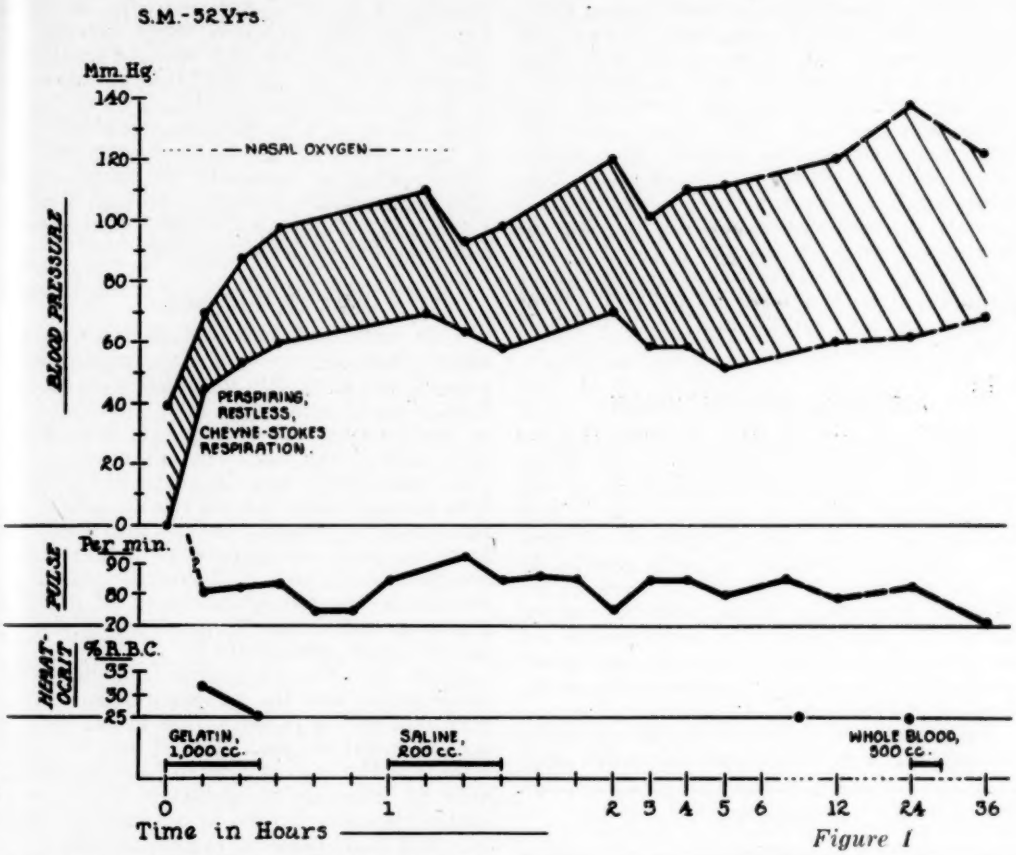

Figure 1

nula that it can be carried out without much injury to the artery employed. Some of these operations were carried out on a ballistocardiographic table which permits repeated determinations of the ballistic index. This index, based on the degree to which the heart displaces the body as a result of its contraction, is related in some measure to cardiac output. Without going into the question, which is at times hotly argued, of the value of the ballistocardiogram in determining cardiac output, it is a very satisfactory method for showing changes even though one may not be sure of the absolute amounts.

THREE CONTENDERS

We might now look at the three leading contenders in the field whose characteristics are shown in Tables VII, VIII, and IX.

Gelatin, derived from bone, was perfected for intravenous use by the Knox Gelatine group during World War II. I believe that it is fair to say that it was superior to most other gelatin preparations, so far as pyrogenicity and retention in the circulation were concerned. It proved to be a very safe substance to use and I suppose we have given it to three or four hundred individuals, for one purpose or another. It has one very serious defect for military use and that is a high gel point so that the material is commonly in a gelled condition at room temperatures, about 20° Centigrade. It becomes fluid below body temperature so that if warmed up or kept in a warm closet there is no difficulty with its administration. Unfortunately, this is a burdensome restriction under emergency

TABLE VII

OSSEIN GELATIN
(Knox P-20)

1. Antigenicity — 0
2. Pyrogenicity — 0
3. Renal Function — unimpaired
4. Hepatic Function — mild BSP retention
5. Effectiveness in Hemorrhagic Shock — excellent
6. Persistence in Circulation — over 50% at 12 hours
7. Storage — none demonstrated — metabolized
8. Fluidity — high gel point
9. Supply — bone gelatin limited (skin gelatin ample)
10. Reproducibility — excellent

conditions, especially when heating and lighting systems may be knocked out. In an effort to overcome this objection, Dr. Linus Pauling and Dr. Dan Campbell[8] and[9] of the California Institute of Technology, developed oxypolygelatin with the use of two reagents, hydrogen peroxide and glyoxal. They maintained that this eliminated pyrogens so thoroughly that cruder sources of gelatin could be used, the material remained liquid at ordinary room temperatures, and proved safe and apparently effective in human studies of limited scale. We have employed recent batches in between 20 and 40 individuals without difficulty.

ANOTHER MODIFICATION

More recently, another modification of gelatin has been prepared but, so far, it has not reached the stage of clinical testing. It remains fluid down to within three to five degrees centigrade, but it preserves the same desirable characteristics of P-20 gelatin, as far as retention is concerned. Work is actively in progress with this material but we do not yet have results of experiments designed to prove its safety for parenchymatous organs, nor has human experience been accumulated as yet.

Table VIII shows the good and bad points of dextran. Apparently there are a few indi-

TABLE VIII

DEXTRAN

1. Antigenicity — rare
2. Pyrogenicity — ±
3. Renal Function — some decrease in TmPAH in some patients
4. Hepatic Function — unimpaired
5. Effectiveness in Hemorrhagic Shock — excellent
6. Persistence in Circulation — satisfactory
7. Storage — little if any demonstrated — metabolized
8. Fluidity — excellent
9. Supply — can be gradually increased without limit
10. Reproducibility — somewhat difficult to achieve

viduals who are sensitive to it, especially persons who have recovered from certain types of pneumonia. It is believed that the pneumococcus elaborates polysaccharides sufficiently close in character to dextran to produce this sensitization effect. While we have rated the pyrogenicity as zero on the basis of our own experience, trouble has been encountered with delayed pyrogen reactions in certain groups of patients, notably in some of those studied at the Brooke General Hospital by Colonel Pulaski. It is our present belief that the material can be made in a non-pyrogenic form. One of the lots employed at the Hospital of the University of Pennsylvania by Dr. A. Michie[10] yielded an unexpected finding in three of five patients, in whom renal clearance studies were carried out. These three patients each showed significant decreases in the maximal tubular exeretion of para-amino hippuric acid. Two of the patients were in a moderately advanced stage of their diseases and succumbed before follow-up could be repeated a few months later. The third patient, however, did have a repeat study and while there was some improvement this was not entirely complete.

TWO CASES

We have had two individuals who had either postoperative or posttraumatic hemorrhages, following the administration of dextran. One of these was a man with a number of broken ribs who developed a hemothorax about the fourth day. The other was a man who had a bowel resection who had a rather late postoperative hemorrhage within the lumen of the bowel. It has also been the impression of our physiologists that oozing from cut-down sites had been unusually severe with one particular batch of dextran. Bleeding and clotting times, however, did not clearly show abnormalities.

The retention of dextran appears fairly satisfactory and the evidence seems pretty adequate that it is not stored in the body to any material degree. That it can be metabolized in the body is indicated by the appearance of radio-active carbon in the form of carbon dioxide, expired by animals who have received small doses of tagged material.

Table IX, that on polyvinylpyrrolidone, I believe is self explanatory. We have seen

TABLE IX

POLYVINYLPYRROLIDONE
(P.V.P. — PERISTON)
3000 cc. Limit Respected

1. Antigenicity — 0
2. Pyrogenicity — 0
3. Renal Function — unimpaired
4. Hepatic Function — unimpaired
5. Effectiveness in Hemorrhagic Shock — very good
6. Persistence in Circulation — satisfactory
7. Storage — remains in R-E system for weeks
8. Fluidity — excellent
9. Supply — capable of rapid expansion
10. Reproducibility — production of narrow range of molecular sizes somewhat uncertain

one apparent antigenic reaction coming on shortly after an infusion was started. The patient was thought to become pulseless and felt very badly. The intravenous needle was immediately withdrawn from the vein and the patient recovered almost as promptly as her trouble appeared. As always, with these sudden phenomena, it is rather difficult to evaluate the observations made.

The material is stored in the body to a considerable degree, being represented by vacuoles in reticulo-epithelial cells in the liver, spleen and other areas, for some weeks after administration. On the basis of the large German clinical experience, it may be that this is not particularly harmful. Most would agree, however, that it is somewhat undesirable. The Germans limited the volume of this material administered to 3,000 cc. and we have not exceeded this amount in any one patient where P.V.P. has been used.

SALINE SOLUTION

Much has been written in recent months about the use of physiological saline solution in shock. I believe that most of the people who have investigated the problem would be willing to agree that physiological saline was decidedly better than nothing in the treatment of hemorrhage and burns. Specifically, Parkins[11] and his associates found that saline, given in a volume equivalent to a quantity of blood drawn from the circulation of a dog, resulted in a prompt rise in the blood pressure and a fairly well sustained hemodilution as determined by hematocrits. In this regard, saline is far more effective than is glucose and water. While it is fairly conceded that the sodium and chloride ions diffuse freely through capillary walls, it appears that their movement through cell membranes may well be more restricted and that, when saline increases extra-cellular volume, a part of this increase remains within the intravascular compartment even though much may appear as interstitial fluid. Its possible usefulness in shock when better agents are not available is, I believe, important to keep in mind.

In experimental burns in rodents, the effect of saline is very striking indeed. Dr. Sanford Rosenthal[12], of the United States Public Health Service, conducted a series of experiments during World War II which are now classic. These demonstrated that physiological saline solution was very valuable in reducing the mortality in burned mice. It appeared that the sodium chloride content of plasma could account largely for the beneficial effect of this material in the burned mouse. Dr. Miles McCarthy[13 14] has confirmed and extended these results in the rat.

STILL ON TRIAL

Still undergoing trial are polyglucose, a Dupont synthetic dextran; oxypolygelatin, which has already been discussed; and certain new modifications of gelatin.

Turning from the description of these agents to their usefulness, I would like to cite the case of a very ill child with peritonitis who was picking at the bed clothes, restless and talking irrationally, and who responded to an infusion of gelatin by losing all of these signs of cerebral irritation within half an hour. Presumably, this was accomplished by improving cerebral blood flow. Undoubtedly, the improvement in the circulation safeguards all of the parenchymatous organs, including the liver.

The plasma expanders also help the body to get rid of edema fluid due to hypoproteinemia. Some years ago, acacia was given to hypoproteinemic dogs immediately before wound healing experiments were carried out and, to our amazement, the delay in wound healing due to the hypoproteinemia disappeared. Chronic ulcers on the animals paws promptly dried up and began to heal. Acacia has no known nutritional value so that the good results were due either to a further release of plasma protein from the blood stream or due to a reduction in interstitial fluid.

YIELDS

In the presence of a complete protein, there is evidence that gelatin can be metabolized to perhaps the extent of 35 per cent. It yields all but four of the essential amino acids. Dextran apparently yields some glucose in the body. The amount broken down is probably small compared with the total caloric needs of the body. P.V.P. has no nutritional value as far as is known but it has a unique capacity of absorbing certain toxins not normally excreted by the kidney and carrying them out into the urine. It has been used in Germany for the treatment of severe forms of diphtheria and favorable results were reported.

One danger in the use of a plasma expander after trauma is that the patient may not have hemostasis. If he does not, the elevation of blood pressure may well increase bleeding and, if the infusion of the expander is continued, it will in effect wash out the red cells. It is, therefore, of great importance to take all possible steps to be sure that the blood loss is stopped and that it does not recur when these materials are used.

A number of studies were carried out in World War II to determine to what extent blood could be replaced with plasma. Best and Solandt[15] reported that plasma could be substituted for whole blood in substantial amounts and Blalock[16] found that survival was possible even when the hemoglobin was lowered to one-fourth of the normal level by such replacement. These experiments were done in dogs.

CLINICAL EXPERIENCE

While recovery from a hemorrhage which has been stopped is one thing, readiness for a surgical operation is another and clinical experience has been almost universal in indicating that those casualties who require major surgery need whole blood for the operation. Furthermore, comparatively little work has been done in burns though Rosenqvist and Thorsen[17] in Sweden have reported good results with dextran and Evans[18 19] in Richmond has reported good results with both gelatin and dextran.

In summary then, we have three well tried plasma expanders: gelatin, dextran, and P.V.P. Any one is good enough to be very valuable if plasma and blood can not be had.

The difficulty in reaching a decision regarding stockpiling is due, in large part, to the fact that there are three good agents instead of one. Each has its weak points but all have come through fairly extensive clinical trials. Each can be made in many different molecular sizes and the different sized molecules have very different effects. Carefully designed specifications and rigid adherence to these specifications will be of the utmost importance.

Regardless of what expander eventually gains ascendency, the important thing to emphasize is that we already have three good agents which could be of the utmost value, should large scale disaster strike after they had been produced and distributed in adequate amounts.

ONE ATTRIBUTE

Before concluding this paper, it is necessary to ask, "How far can a plasma expander be used as a substitute for blood?" The successful plasma expanders have only one important attribute of blood — they hold water and with it electrolytes in the blood vessels. They do not carry oxygen or carbon dioxide to a significant degree. They do not aid in coagulation. They do not contain antibodies nor other agents for the defense of the body against infection. Some of them may contribute a little to the nutritional requirements of the body but this is a comparatively minor factor.

However, by their one attribute of holding water and electrolytes in the circulation they can aid a man in shock in many ways. They raise blood pressure, decrease pulse rate, increase cardiac output, bring warmth to the extremities, increase blood flow through the kidneys with favorable effects on urinary excretion. Therefore, although their field of usefulness is limited, they supply a critical need of the patient with an acute loss of circulating plasma volume.

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A New Antihistaminic Combination

The Lilly Research Laboratories have prepared a new series of compounds possessing striking antihistaminic properties. The most effective of these is 'Pyronil' (Pyrrobutamine, Lilly), which was shown by animal tests to have a longer duration of effect than that of any other known antihistaminic. During the 1951 hay-fever season, research clinicians reported superior results in an impressive majority of cases. Side-effects in effective therapeutic doses were usually negligible.

The drug is slow in onset of action. This characteristic is overcome by the combination of 15 mg. of 'Pyronil' with fast-acting Thenylpyramine and Cyclopentamine. The resulting formula ('Co-Pyronil') thus gives prompt action followed by prolonged relief.

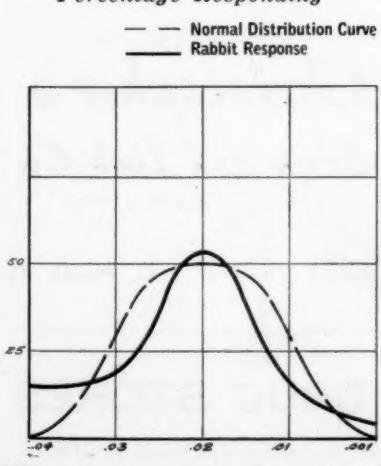
VARIABILITY OF INSULIN RESPONSE IN STANDARD RABBITS

By Theodore M. Feinblatt, M. D.
and Edgar A. Ferguson, Jr., Chemist, Brooklyn, N. Y.

While testing a number of insulin compounds for effectivity and time of action it was found necessary to standardize rabbits for insulin response. Standardization was carried out in the usual manner with a dose of three clinical units per kilogram. The expected blood sugar drop was 25 milligrams per unit per kilogram.

Fifty rabbits are reported. Tabulation shows that the results follow the normal distribution curve. This is the distribution usually found when any animal trait is measured. Approximately 50 per cent fall in the middle group, 20 per cent in the less sensitive group, and 20 per cent in the more sensitive group. There are a few extremely insensitive rabbits and another small group is extremely sensitive.

The very sensitive group responds by showing symptoms of clinical shock in excess of the normal, and the extremely sensitive small group will die if not treated during this shock. For the sake of convenience a table has been drawn dividing the groups into five parts. The center or third column is the normal. The left hand side shows the more sensitive and extremely sensitive. The right hand side shows the more insensitive and the extremely insensitive.



Milligrams response per unit per kilo for rabbits. (The normal for rabbits and humans is .02).

BLOOD SUGAR DROP IN RABBITS

COUNT	MILIGRAMS DROP PER UNIT PER KILOGRAM				
	40-35 (SENSITIVE)	35-30	30-20	20-15	15-10 (INSENSITIVE)
1	38	31	28	20	15
2	36	35	30	15	15
3		33	27	18	10
4		33	29	18	10
5		31	24	19	
6		32	26	21	
7		32	22	18	
8		32	26	18	
9		31	28		
10		32	21		
11			25		
12			29		
13			29		
14			29		
15			27		
16			29		
17			21		
18			29		
19			22		
20			21		
21			29		
22			25		
23			24		
24			25		
25			21		
26			28		

*Note: The count column shows the number of rabbits having the indicated range of blood sugar change.

CONCLUSIONS

As in every measurable animal trait the insulin response of rabbits follows a normal bell-shaped distribution curve.

This curve holds true for the individual variation of all measurable animal traits except in cases where at some point the variation is lethal.

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